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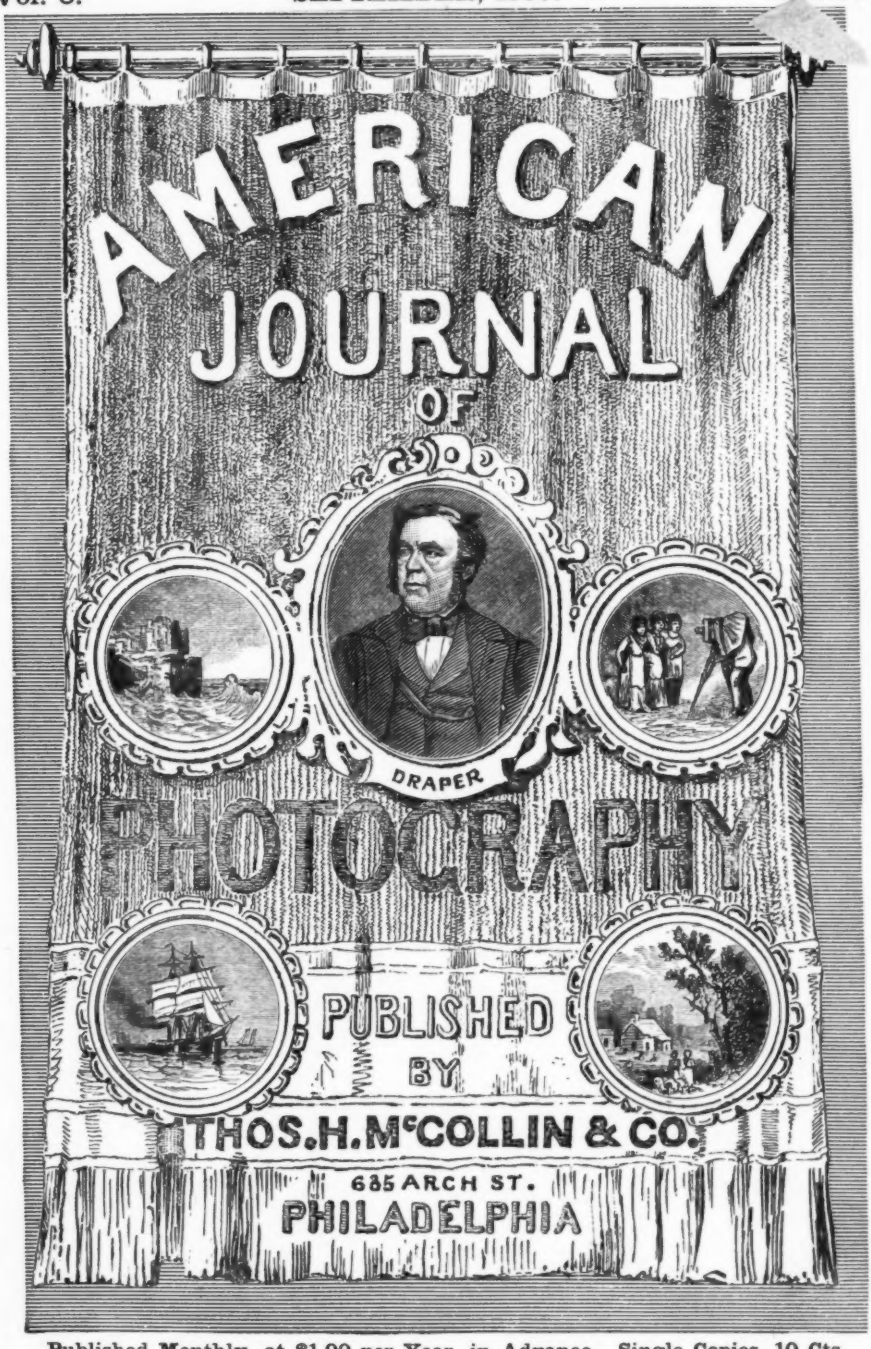

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THE QUESTION OF THE DAY.

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AMERICAN

JOURNAL OF PHOTOGRAPHY.

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AMERICAN
JOURNAL OF PHOTOGRAPHY,
PUBLISHED MONTHLY.
$1.00 per Annum, in Advance.

The Chicago Convention.

WE are pleased to say, "financially" our convention was a success. The attendance was large, the coffers are filled; but here, unfortunately, our eulogy must end; in many other respects it was not a success. Comparisons are odious, but it is natural to make them. Compared with other exhibitions, the Chicago one will be found wanting. The percentage of good work was less than that of St. Louis; the amount of positively bad work more in the ascendency. There were indeed individual exhibits which demand the highest praise; but one cannot conceive why so many obviously inferior photographs were allowed to be hung.

True, our conventions are schools: but they are not infant schools, for the encouragement of the immature in our profession. The standard of excellence must always be high, even if the unskilful fail to reach the mark and become discouraged. We cannot sink our criterion to the level of some men's disadvantages, men who are not favored by a happy environment. The inexorable law of the survival of the fittest applies as well to our profession as to any other phase of social life.

The man with one talent generally buries it and complains of the unjust and harsh lord, but he with five talents meanwhile gains five other talents.

But to return to our convention the impression upon entering the building was that the Lord of Misrule had there set up his kingdom. The space was too great and the effect scattering and bewidering. The energy, tact, and good taste of the manufacturers and stock dealers in a measure surmounted the disadvantages and produced a creditable display, but there was a want of condensation, and one had frequently to wander around the numerous cenotaphs of a former exposition before he reached the object of his pursuit. In the art hall, the same lack of co-ordination was manifest. There was neither evidence of purpose or design in the manner in which the exhibits were arranged, if arranged they were. The unpleasant effect produced by the unwise restriction in regards to framing was apparent; but we have said enough on this subject before. It is another example of the folly of trying to satisfy the man of one talent.

The place of assembly was unsuited for an auditorium, and much valuable time was wasted in unnecessary business complications, so that it was found necessary to hold an evening session for the reading of papers and for discussion. It began well. A large and intelligent audience was present; several valuable papers were read, and listened to with much interest.

More were to follow. The questions asked by members promised to evolve discussion of value, but unfortunately the tide was allowed to drift into a disputation of the virtues of a certain manufactured article, until the time for adjournment arrived.

We learn with regret that a large meeting of members of the association was held at the Palmer House to express their dissatisfaction at the awards made by the judges.

They were even so foolish as to embody their sentiments in a set of resolutions, and to threaten secession.

We have frequently said, "the judge's lot is not a happy" one. These grumblers and dissatisfied ones outcrop at every convention, but the crop this year unfortunately was larger than usual.

They are the men who always wish you to know that they did not expect a medal; they dispute only for principle; self-interest is no agent in their motive.

By what principle is their judgment made superior to the verdict rendered by the judges, whose final opinion is based upon the concurrence of the judgment of several, while the disaffected man's estimate must be a result of individual personal opinion.

The dissatisfied members had not even a shadow of excuse for their unwise proceeding. In this special case the gentlemen selected were not only men of acknowleged capacity and good judgment, but were the unanimous choice of the assembly. Their appointment was received with acclamation, no doubt the very dissenters joining loudly in the acclaim.

If at their appointment they were respected for their skill, good judgment, and honesty of purpose, it is to say the least unkind on the part of the disaffected to now call in question their ability and probity.

Another procedure we regret is the loss of the Biennial proposition. One year is really too short an interval. Progress could be better shown if a longer period was established.

Those who bear the principal part of the labor and expense in trying to make the convention a success should have their views treated with more consideration; at least they should not be dismissed in the summary manner they were.

Considerable dissatisfaction was also shown when the place of the next meeting at Minneapolis was decided upon. This is the third western city in succession, and the eastern members feel that their claims have not been considered. Some even seriously proposed the formation of an eastern branch of the association. The elements of disrupture seem rampant, but we hope that some controling influence will restore harmony.

Award of Medals.

Class A.—Portrait photography—F. W. Guerin, St. Louis—one diamond badge; H. McMichael, Buffalo; G. M. Elton, Palmyra, N. Y.; J. M. Appleton, Dayton, Ohio; W. H. Potter, Indianapolis—each one gold medal; S. L. Stein, Milwaukee; J. C. Strauss, St. Louis; O. P. Scott, Chicago; S. V. Courtney, Canton, Ohio—each one silver medal.

Class B.—For collection of large photographs, contact prints not vignetted—S. V. Courtney, Canton, Ohio—one gold medal; P. H. Rose, Providence, R. I., one silver medal.

Class C.—For collection of two dozen cabinets, bronze medal to each of the following—C. C. Urlin, Columbus, Ohio; G. L. Temple, Clinton, Iowa; J. J. Gibson, Ann Arbor; George W. Wise, Zanesville, Ohio; L. E. Miller, Alliance, Ohio; B. La Marsh, Kenosha, Wis.; Stuber Brothers, Louisville; H. M. Waide, Quincy, Ill.; C. Poole, St. Catharine's, Ont.; Palethorpe, Greenville, Mich.

Class D.—Composition for genre pictures of any kind—G. B. Wood, Philadelphia, one gold medal; H. Randall, Ann Arbor, Mich., one silver medal.

Class E.—Landscapes—George Barker, Niagara Falls, one diamond badge; S. W.

Burnham, Chicago, one gold medal; P. B. Green, Chicago, one silver medal.

Class F.—Best marine views—J. S. Johnson, New York, silver medal.

Class G.—Best interior views—H. G. Peabody, Boston, silver medal.

Class H.—Best instantaneous views—H. G. Peabody, Boston, silver medal.

Class I.—Best architectural photography—C. D. Arnold, Brooklyn, silver medal.

Class J.—Best photo transparencies—No competition.

Class K.—Photography applied to science—Henry D. Tolman, silver medal.

Foreign Exhibit.—Oscar Suck, Karlsruhe, Germany, gold medal, and D. Anderson, Rome, Italy, silver medal.

The judges were Dr. John Nicol, Dr. A. H. Elliott, James Inglis, Charles Goebel, and E. Long.

EASTMAN PRIZE AWARD.

Judges—W. H. Potter, Indianapolis, C. Poole, St. Catharine's, H. McMichael, Buffalo.

Number of entries—42.

Prints exhibited—343.

Plain Enlargements.

Class A.—$150 for the best collection of unfinished enlargements, J. F. Ryder, Cleveland; $75 for the second best collection of unfinished enlargements—Kuhn Brothers, St. Louis.

Class B.—$50 for the best unfinished portrait enlargement—J. F. Ryder, Cleveland; $25 for the second best unfinished portrait enlargement—Hulbert Brothers, St. Louis.

Class C.—$25 for the best unfinished enlargement from landscape or marine view negative—W. B. Bell, Pittsburgh.

Contact Prints.

Class D.—$50 for the best collection of contact prints—W. H. Walmsley, Philadelphia.

Finished Enlargements.

Class E.—$100 for the best enlarged portrait finished in black and white—J. Weber, New York; $50 for the second best enlarged portrait finished in black and white—J. T. Ryder, Cleveland; $25 for the third best enlarged portrait finished in black and white—J. C. Strauss, St. Louis.

Class F.—$100 for the best enlarged portrait finished in color—J. C. Strauss, St. Louis.

THE STANLEY PRIZE

Of $100, for the best picture by the Stanley dry plate, was awarded to H. McMichael, of Buffalo, N. Y.; a gold medal was obtained by G. M. Elton, of Palmyra, N. Y., for pictures on Stanley plates; and a silver medal by O. P. Scott, of Chicago.

THE ANTHONY PRIZE

Of $100 for best enlargements on their new bromide paper, was awarded to the exhibit having the private mark of a five-pointed star. The owners of the pictures are the Brooklyn Photo Enlarging and Contact Printing Co.

THE MORRISON PRIZE

Of a set of triangle lenses, for the best collection of work other than portraits, made with the Morrison lens, was awarded to C. D. Arnold, of Brooklyn, N. Y., for his excellent collection of architectural photographs.

THE BLAIR CUP

For the best single picture in the entire collection, was given to James Lardy, of Cincinnati, Ohio, for the composition picture entitled "Man, know thy Destiny."

THE BECK LENS PRIZES,

By Wm. H. Walmsley & Co., Philadelphia, were awarded as follows: To J. F. Ryder, Cleveland, Ohio, No. 7 lens, with Iris diaphragm, for best portraiture up to life size; to M. P. Warner, Holyoke, Mass., No. 5 lens, with Iris diaphragm for the best landscape and general work.

Intensification of Gelatine Negatives with Nitrate of Silver, Gallic Acid and Per-Chloride of Iron.

PRESENTED AT THE CHICAGO CONVENTION BY JOHN BARTLETT.

ON the very advent of the gelatine plate, its detractors found their strongest attack in the difficulty attending intensification.

Many and evil, one is almost tempted to say, are the methods which have been proposed to infuse strength into a weak dry plate negative.

There is such a liability of the image to change, and so great danger of staining the film attending the operation, that photographers have come to look "askance and strangely" at any new formula proposed.

Despite the injunction, to secure proper density by proper exposure and development, there are times in everyone's experience when recourse must be had to some means for saving a negative, to save one's reputation.

It is just at such moments that one longs for the good old silver intensifiers of collodion days.

Mercurial intensification, notwithstanding the facility and rapidity of its action, has proved too often a delusive hope.

Intensification with silver is the great desideratum. The only drawback to its general employment is the great danger of staining the gelatine film.

Nevertheless, the results it yields, when care is exercised, are so far superior to those obtained by any other method, and the assurance of permanency so much greater, that many endeavors have been made for an application free from the tendency to stain.

Hitherto the methods employed have insisted upon the necessity of the use of acids and other restrainers directly in the intensifying solutions. But, as Doctor Ellerslie Wallace has shown in a paper on Silver Intensification published, in the June, 1887, number of the *American Journal of Photography*, the presence of an acid with the silver and gallic or pyrogallic acid, tends only to slow the operation, and by subjecting the plate longer to the action of the fluid really increases the risk of discoloration.

At the April meeting of the Photographic Society of Philadelphia, I communicated a method for intensifying gelatine negatives with nitrate of silver and gallic acid, in which neither an acid nor any other restrainer is added directly to the intensifier.

The formula was the result of experiments of Mr. John G. Cassebaum of Philadelphia.

The negative, after it has been thoroughly fixed and thoroughly washed, is placed in a preliminary bath composed of:

Nitric Acid, ... 10 drops.
Chrome Alum, . . 1 ounce.
Water, ... 20 ounces.

Citric or acetic acid may be substituted for the nitric acid in the proportion of one ounce to twenty of water.

In this bath the negative is rocked for a few minutes, rinsed under the tap and then placed in the intensifier, which is made as follows:

(*a*.) 80 grains of gallic acid are dissolved in 1 ounce of alcohol (95 per cent.), and the solution kept until all turbidity subsides.

Care must be taken to select a good quality of gallic acid, as upon its purity everything depends.

(*b*.) 30 grains of nitrate of silver are dissolved in 1 ounce of distilled water, and after a good sun bath, filtered from any black sediment.

To prepare the intensifier for immediate use, take

1 drachm of each of these stock solutions (*a* and *b*) to the ounce of water.

The gallic acid and the nitrate of silver may be mixed directly in the graduate and the water added afterwards, without any fear of precipitation, provided everything is clean and the chemicals pure.

Place the negative in a scrupulously clean dish, glass or porcelain preferable to rubber, and pour over it the intensifying solution; keeping the dish in gentle motion to insure uniformity in the deposit.

The negative will gain in strength more rapidly than when a restraining acid is present, and any desired degree of intensity may be obtained.

The essential conditions for success are thorough elimination of hypo from the film and the utmost cleanliness in manipulation.

The necessity of the preliminary bath will be apparent at once, if application of the intensifier is made without its previous agency — an almost immediate staining of the negative taking place.

The object of the chrome alum is merely to counteract the softening influence of the acid in the preliminary bath; it may, therefore, be omitted in cold weather, or when there is no tendency in the film to frill.

Having thoroughly tested the virtues of Mr. Cassebaum's intensifier, I submitted it to a number of practical workers, who highly commended it for its efficacy.

I was, therefore, much surprised at reading in the *British Journal of Photography* comments upon it anything but flattering.

The editor severely criticised it "*as lacking in agreement between results proposed and obtained*," declaring that "*the preliminary bath as recommended, and the absence of restrainers in the intensifying solution, entirely destroy any possible advantage derivable from the Philadelphia formula.*"

This verdict of so eminent an authority in photography, induced me to thoroughly investigate Mr. Cassebaum's formula, to discover the cause of any possible failure.

The result of a great number of trials strengthened my belief, not only in its superiority over the other methods of silver intensification, but confirmed my opinion of the simplicity and uniformity of its action.

During the course of my investigations, however, I discovered a modification of the original method, which is acknowledged by Mr. Cassebaum to be a decided improvement.

The modification is in the constitution of the preliminary bath, which is as follows:

4 grains Per-Chloride of Iron.
4 " Citric Acid.
2 " Chrome Alum,

to each ounce of water.

The negative is immersed in this solution and kept in constant motion for a minute or two; but not long enough to occasion a bleaching of the film.

On removal the negative is well washed and placed in the gallic acid and silver solution, as given in the formula above.

It will be found to build up much more rapidly than by the former method, keeping perfectly clear and brilliant, even if allowed to remain a long time in the solution.

There seems to be no liability to stain, of the film so treated.

After the necessary strength is attained the negative is again washed until all greasiness disappears from the surface. This apparent greasiness is caused by the imperfect assimilation of alcohol and water.

Finally, as a precaution for the removal of any uncombined silver, the plate is dipped for a minute or two in hypo, and then washed.

Should a slight opalescent film appear upon the surface on placing the negative in the intensifier, do not regard it with any seriousness. It is due to insufficient washing on removal from the per-chloride of iron, and is easily rubbed off with a piece of wet cotton, and will entirely disappear in the hypo.

If the negative is allowed to remain in the per-chloride of iron until the film bleaches the subsequent immersion in the hypo will greatly weaken the image which has been strengthened by the silver.

It seems that the chloride of iron, acting upon the film, forms a nucleus for the

deposit of the silver reduced by the gallic acid: and the intensification is a genuine building up of the image, and not a mere staining of the film with an adiactinic color, as is the case with certain other intensifiers.

With this modified intensifier I have strengthened negatives of so pale images that mercury was incapable of producing any amelioration.

As the per-chloride of iron is in itself a reducer, and also a clearer, its preliminary action in intensification will be found of great value in removing any chemical fog upon the negative, which, if suffered to remain during the intensification, would also strengthen along with the image, and detract materially from the brilliancy of the result.

This clearing action of the per-chloride of iron gives a brilliancy to theintensified negative, so that it can scarcely be told from a well-developed plate.

In making known this modification, I desire it to be not forgotten that the credit belongs essentially to Mr. Cassebaum for being the first to successfully employ silver and gallic acid as an intensifier for gelatine plates without necessitating the slowing action of acids and other restrainers. I am abundantly gratified in having my modification regarded as an improvement upon his original method.

JOHN BARTLETT,
Philadelphia.

Gelatino-Bromide Paper as a Basis for Finished Work.

PRESENTED AT THE CHICAGO CONVENTION BY G. HANMER CROUGHTEN.

THE greatest opposition to the use of gelatino bromide paper in this country has come from the artists. Photographers have been charmed with the results, but they have been forced to discontinue its use because the artists they employ either could not or would not use it as a basis for either crayon or color. This opposition has been founded upon a want of knowledge on the part of the artists, and also from a fear that the bromide paper would hurt them in regard to prices. There has also been an idea that the power of handling was limited, and that broad artistic effects by stump and rubber could not be produced upon it as well as upon solar prints. During the nine or ten months I have been with the Eastman Company I have proved to the satisfaction of some hundreds that not only can all the effects possible upon any other kind of print be obtained, but it possesses some advantages which no other paper has, one of which is a most important one, and that is the power to lighten any deep shadow without injuring the surface of the paper. Slight as is the thickness of gelatine, you can remove with either rubber or scraper the deepest shadow in a bromide print *without touching the paper under it.*

Eastman's permanent bromide paper is in this respect far in advance of its English predecessor. In the first place the English paper is too smooth, and the emulsion too thick. The paper itself is an important item. It should have a very decided texture of a particular kind, and the emulsion should be thin enough to size the paper without filling up the grain. These requirements are admirably filled by the C paper made by this company, and I prefer it for all kinds of finishing.

CRAYON FINISHING.

As crayon is the most popular material I will commence with that. The materials wanted are Conte Crayon Sauce, Nos. 1 and 3; Conte Crayon ordinary, and Nos. 0 and 1 superfine in wood; three or four leather strips of various sizes: one ream paper, stippling straps, a stick of ordinary office ink eraser, and two rubber strips, soft and medium; some pumice-

stone, very finely powdered, and a quantity of carded cotton.

The print to be worked should be printed fully out, that is it should have every graduation from high light to deepest shadow, and should look a little darker than wanted for a plain print. It should be mounted upon a muslin-covered stretcher, as the best effects cannot be obtained if the print is mounted upon a cardboard. Great care shonld be taken that no starch gets upon the face of the print during mounting.

Material for Stippling. — Take one stick of the Conte crayon sauce and crush it finely; two sticks of No. 1 Conte crayon must be finely powdered by rubbing them upon glass or sand paper, No. 2, and be intimately mixed with the Conte sauce.

Place the print flat upon a table. Have a piece of cardboard by the side of the print. Take a turn of cotton and dip it into the mixture and rub it upon the cardboard to spread and equalize it, then transfer it to the background of the print, rubbing gently with a circular movement right up and over the edges of both face and figure. Do not be afraid of spoiling your print,as it is easily taken off with the rubber. In putting in your background see that the darkest part is kept low, just over the shoulders, and bring the shaded side of the background up to the lighted side of the face, which should contrast with the shaded side of the face and figure, while a bold shadow should be put in just over the shoulder to balance and represent the cast shadow. When you have got in your background roughly, put aside your cotton and straighten out the three longest fingers on the right hand and rub lightly all over. This is the most important part of the background. The fingers must feel the crayon roll evenly under them, and if they do not, but catch the paper instead, there is not enough No. 1 Conte in the mixture, and more must be added till a gritty feeling is obtained. Then go ahead, rubbing all over the background with a circular movement, taking no trouble to keep off the face or any other part of the picture. If you wish to darken any part rub the tips of the fingers with the mixture and transfer the crayon taken up on to the part of the print which needs it and rub it in. An even tint can be rubbed all over a black coat or other dark drapery in this manner, shadows deepened, and the hair strengthened. In fact all that is usually done by the chamois skin upon color prints can be done with the fingers upon the bromide paper. Now take a large piece of clean cotton, and after knocking the superfluous crayon off the picture, rub evenly all over. This will considerably lighten all the crayon, but, if not light enough, or there are any inequalities in the background, dust a little pumice powder evenly all over, and go over it all again with the finger, using more pumice powder wherever you wish to lighten, but being careful not to use too much, as an excessive use of pumice powder will rub down and flatten the grain of the paper. If these directions have been carefully followed, the background will show a beautiful grain or stipple, so like a hand stipple that it has puzzled experts to detect the means adopted for producing it. This grain can be varied by the method of handling; with a light rub a large open grain can be obtained, and the heavier the rubbing the smaller the grain will be. Now rub again with clean cotton and place the picture upon an easel. With an ink eraser clean the edges of the background, and blend with the cotton. At this stage any amount of artistic effect can be put in and taken out of the background. The stump can be used to hatch in broad effects, and the ink eraser to take out

lights, etc. This part of the work it is impossible to describe. Individual taste and experience are the only guides, and the beginner had better not attempt too much in that line till experience has given him confidence.

Having thus far gotten your background in order, we will proceed with the figure. Begin to clean up the face with the rubber stump, taking out the high lights upon forehead, cheek bones and chin, and blend with a small turn of cotton. In some cases this handy little tool may be made more effective by dipping it just before use into the powdered pumice; thus, by the use of the rubber stump and cotton blender, the modeling of the face can be worked out and the beginner will now be surprised to find how much lighter the face appears. In fact it lacks decision, which we will now proceed to put in. Take one of the stippling stumps, and rubbing it in the sauce before described, mark in the pupils of the eyes, the lines of the eyelash, the shadows under the eyebrows, the brows themselves, the nostrils, and the shadows under the chin, blending all with cotton. Next deepen the shadows of hair and drapery with one of the leather stumps, blending also with cotton or the fingers, now on the deepest shadows of the drapery, and everywhere where decisive touches are wanted. Mark in strongly with Conte, No. 5, crayon, and blend with the fingers. Do not touch these shadows with the cotton or you will destroy their firmness. When you have got thus far you will be surprised what an effect you have obtained with little labor, and now any amount of finish can be obtained by working with the point of crayons No. 1 and 0. The filling in of the face is best accomplished with No. 0, and should be done in the same manner as retouching a negative, filling in and softening breaks or inequalities in the gradations. The No. 1 is useful in rounding and marking the eyes, eyebrows, hair, etc. White drapery should never be touched with white crayon. Any amount of light can be taken out by the hardest rubber, and dark shadows can be lightened with it. Great effect can be obtained by first covering the white drapery with a light tint of crayon sauce rubbed evenly all over with cotton, and the lights taken out with the soft rubber. Lace can be made out in this manner with great effect, and with far better harmony than can be obtained by the use of white chalk, which gives a metallic effect, and for that reason should only be used upon the high lights of jewelry, etc.; but, as a rule, the less white chalk used the better.

(To be continued.)

Prints and their Surface Finish.

BY ELLERSLIE WALLACE.

THE good general appearance of any photograph on paper will depend, among other things, upon the surface which it presents.

When we consider the photograph as a piece of mechanical work, its surface might fairly be ranked in the same category for comparison with the surfaces of various styles of wood-work; that is to say, the photograph might present either the plain surface texture of the paper on which it is made, or be burnished to the very extreme of brilliancy; the wood, in like manner, presenting either its own natural surface, as left by the cutting tool, or be oiled or polished to a high gloss.

The polished surfaces of our modern high-class photographic work, are admired by the public in general as being an evidence of finished workmanship; and whatever objections may be made to the said glossy surface, the fact is certain that the detail of the print is more brought out, and the deep shadows

heightened in brilliancy and lustre. To repeat our comparison above, the grain or detail of a fine piece of wood will notoriously be more brought out and deepened in tone by French polishing or skilful varnishing.

It is by no means to be wondered at then that the general public, untrained as they are to the critical points of excellence in photography, should prefer the showy and high-glossed surface, but it is very doubtful whether a refined taste would always be satisfied with these artificial effects. The surface of any print that has been lubricated and passed through the burnisher is entirely artificial in character, and might fitly be compared to the "shine" of a well blackened boot; a slight rub with any damp substance, and away goes the fine effect!

In a great many cases photographs on paper, so far from gaining, in an artistic sense, actually lose by being finished with a very high gloss, no matter how much more perfect they may be from the mechanical standpoint. This will, perhaps, be more clearly recognized in large prints, where, if the work be honest and good throughout, it will not stand in need of any high gloss to help the effect, but be much better without it. The splendid efforts of Braun of Dornach, and of the Autotype Company of London, for example, would not gain if they were to have surfaces like a patent leather boot; nor would the photo-gravures of Goupil.

The conditions under which photographs are made at the present day are too varied to make it possible even to attempt to lay down rules of good taste for a matter of this kind, but we feel safe in saying that a natural or, sometimes, a mat surface would do well for *large sizes*, especially if the subject presented large masses of light and shade, or of half-tone, or (to use artistic parlance) if there was decided breadth of effect without too much detail. On the other hand, a pretty landscape "bit," full of detail, or a little portrait or group highly burnished and coquettishly framed, would have charms of its own, and not be out of place on a table covered with bric-a-brac and ornaments.

The usual ways of finishing silver prints are plain rolling (with or without the after-application of a wax or so-called encaustic paste), burnishing, cementing to glass with gelatine, enameling with collodion, squeezeeing to glass or ebonite (and afterwards removing), varnishing, etc.

The latter method has rather gone out of date, and yet it is excellent for protecting prints that have to be much handled or exposed to an impure atmosphere. It may easily be done by first laying on a weak gelatine sizing, and after well drying, following with a good white varnish.

Burnishing seems, we regret to say, to have largely supplied the place of proper rolling in a rolling press. This is doubtless because a higher surface polish can easily be obtained, while the burnisher costs much less than a good press. It does not, however, harden and compress the fibre of the paper as the press does.

Rolling the mounted print in a double roll press, with a good steel bed-plate, we still consider the best method of finishing the average silver print. A little encaustic paste of wax and turpentine (about the consistency of butter) rubbed into the rolled surface with a clean flannel rag, will increase the brilliancy of the print without adding to the gloss, and be a useful protection against damp air, dirty fingers, etc.

Prints may be enameled by rubbing a little talc over a good piece of glass, and after polishing off, coating the glass with a suitable plain collodion, and squeezeeing the print down upon it while wet. After drying, the whole is stripped from the glass.

Cementing the print to glass by means of gelatine gives superb effects if tastefully done. The print should have a warm tone, and care taken to avoid air bubbles. It may be framed in some maroon or chocolate color, or black relieved with gold.

Prints may be simply squeezeed to glass (well talcked) or ebonite, and removed when dry. The objection to this method is that they lose a part of their gloss when mounted, on account of the moistening by the mountant.

M. Leon Vidal, in a recent number of a French journal, proposes the very clever idea of producing a smooth surface bordered with a matt one on the same print. This is done by having glass plates ground to any desired width around the borders, the centre remaining smooth. The wet print is squeezeed down upon the glass in the usual way. Any desired ornament, either in relief or in depression, may be ground into the borders of the glass, and will, of course, be reproduced upon the print. This is specially adaptable for bromide and platinum prints, and we recommend it to our readers, particularly for portrait work, as a most ingenous and novel idea.

Let us not forget, in concluding, that many of the more ambitious efforts of our art, both as regards size and subject, will be none the less striking if finished with a plain dead surface, such as the platinum or plain silver print. The absence of all straining for effect in the print will thus force the attention upon the legitimate photographic and pictorial qualities, and will often charm the eye of a cultivated person more than all the soap and wax polished stuff of which we see so much now-a-days.

THE protographic press was fully represented at the Chicago Convention by the editors in person.

The Origin and Technology of Photographic Chemicals.

FRANK H. ROSENGARTEN.

FIFTH PAPER.—THE ALKALIES CONTINUED.

IN our last number the sources of salt production were detailed; now we will treat of potash and ammonia, equally as interesting in a photographic view.

Until a recent date potash was produced from the ashes of wood, by washing them with water, filtering and evaporation. The alkali exists in the wood principally in the state of acetate, and being of a fixed and incombustible nature, is left behind after the incineration. The wood is burnt on the ground in a sheltered place, and the residual ash consists of a soluble and insoluble mixture. The soluble part is made up of carbonate, sulphate, phosphate and silicate, and of chlorides of potash and sodium. The insoluble portion has carbonate and phosphate of lime, alumina, oxidized iron and manganese, and a little carbonaceous matter that has escaped combustion. This ash is lixiviated in suitable vessels, with the addition of a small quantity of lime, and the soluble portions brought into solution; and this liquor is filtered from the residuals and evaporated to dryness, and then fused, poured into iron kettles, where it congeals into cakes, and when cool these are broken up and form the old-fashioned potash of commerce. The ashes of plants amounts generally to not more than a few parts in a hundred, and even of these only a portion consists of potash. The different parts of the same plant and different plants vary in the proportions of ashes. Large trees yield less than shrubs and herbs, and branches less than the leaves, and the bark more than the wood; and curiously enough, the leaves of trees that fall in the winter contain more than those of evergreens. Pine wood yields 0.45 parts to 1000, oak bark 2.08, wheat straw 4.18, Indian corn stalks 17.5, dry

oak leaves 24, stems of potatoes 55, wormwood 73. Consequently potash was made only in countries abounding in forests, in Canada, parts of the United States and in Russia, from wood, while within recent years the residues of beet root molasses and the ashes of beets and vegetables have given the larger part of the potash of commerce, from vegetables sources.

The main supplies now come from a source that a few years ago was unthought of. In Stassfurt, Germany, there were salt mines, worked for many years, until the workings got down deep. After most of the good rock was removed, a mineral was found, which gave a very bitter taste and unfitted for ordinary uses, and the mines were abandoned. After many analyses a chemist found that the deposit consisted of chloride of potassium. Obtaining a concession from the German government, he started the great industry, now known all over the world, for producing potash and its salts from this hitherto unknown rock, and just at a time when potash was in the greatest demand for use as a fertilizer in the cultivation of beet roots for sugar making. Just as petroleum was found here at a happy moment, so the potash mine benefitted the world.

Ammonia, as a gas, exists in the free state, as we know it in the state of solution in water, forming a colorless transparent liquid of a very pungent odor and acrid alkaline taste and reaction, is completely volatilized at low temperatures. Water is capable of absorbing 670 times its volume of this gas at 50°Fahr., but increases in bulk about two-thirds. The earliest source of production was Egypt. Dried camel's dung and urine were employed as fuel, owing to the scarcity of wood. Burned in an imperfect manner, the dung was subjected to a rude dry distillation and the dense smoke condensed into soot, containing salts of ammonia! The soot was rammed into glass globes coated with clay till nearly full and heated, when the proper salts sublimed. The sublimate cooled off in the cool parts of the flues and was collected, and came into commerce as sal ammoniac, of inferior quality, grayish color and spongy texture. Later in Europe various animal matters were subjected to dry distillation, yielding tar and ammoniacal vapors and leaving charcoal, or when bones are used, the animal charcoal used in sugar refineries. The English method and probably the great present source of ammonia is the utilization of the washings of ordinary illuminating gas, as made from bituminous coal. This coal contains varying proportions of nitrogenous compounds, which are converted into ammonia by the heat used in converting the coal into volatile hydro-carbons. A ton of good coal will yield about 200 lbs. of English ammoniacal gas liquor. Until within quite recent years, the gas was but little washed, and our older readers can well remember the disagreable odor of gas made in years gone by. Now, in all large gas works, the gas is fairly "scrubbed," and the odorous washings collected and used for the preparation of sulphate of ammonia, from which salt aqua ammonia, sal ammoniac and carbonate and other salts are made. As scientific labors taught the immense value of potash and ammonia as fertilizers to enrich land which has been cultivated many years, naturally manufacturing chemists were stimulated to produce these salts, and from the small quantities that were formerly consumed the production amounts to tens of thousands of tons annually.

Having gone over roughly and briefly the sources of our familiar comrades, the alkalies, we shall give in future papers the various methods of preparing their salts in the form we use them in photo-

graphic work. To the chemist who is familiar with these processes our brief and extremely condensed account will be poor reading, but we believe the readers of this journal who do not claim to be scientists and who use these salts as reagents will at least find something to interest them in such a brief story of their origin and technology.

Our Picture.

ALTHOUGH the exercise of the imagination, the creative power of the painter and poet, is far beyond the highest aspiration of the photographer, yet the quality of suggestiveness may be found in a simple, camera picture as the chief element of its attractiveness.

Photography, despite its intense realism, may tell a story in the drama of every-day life in such a way as to excite interest or sympathy. By a proper selection and combination of actual facts, perhaps individually dull and prosaic enough, a mere photograph can give the mind material for the construction of a picture rich in thought and full of feeling.

When photography thus brings together objects stimulating the association of ideas and creating a mental picture, thereby producing the feeling of surprise, novelty or unexpectedness, it surely deserves to be admitted to the rank of a work of art.

The picture we give our readers this month for their enjoyment has preeminently the quality of suggestiveness, and so we think we may call it a work of art, and its producer an artist.

Mr. William Adcock, of Melton Mowbray, England, is well known to readers of photographic literature by his excellent papers on the relation of art to photography, several of which we have had the privilege to reprint in our magazine.

Mr. Adcock has chosen an episode from the life of the laborer, a study from nature without exaggeration, without modification, typical and true, yet full of suggestion, and withal pleasing.

Like Millet, Mr. Adcock shows that honesty in art is the best policy, relying on the power of truth expressed with feeling and judgment. The effect, therefore, is strking and novel.

We enter at once into sympathy with the subject. The artist has the faculty of seeing conscientiously; and, without pointing a moral, lets the moral follow of itself.

We have entitled the picture "The Question of the Day"—and one can imagine the inevitable conclusion these brawny sons of toil will reach in discussing the relation between capital and labor.

On Exposure.

EXPOSURE, it need scarcely be said, means the act of submitting a sensitive surface to the action of the light sufficiently long to obtain a developable image by accepted and ordinary methods. This is the broad way of looking at it, for, at present, it is an undecided point how long it is necessary for light to act before this developable image is produced. More than one eminent scientist believes that the *most* instantaneous impact of light under any circumstances (that is, strong or weak light) is sufficient to produce that molecular condition that we discover to have taken place on development. In a communication I received from Professor Hunt, he said his opinion was that the mere momentary impact of light was sufficient to produce the requisite molecular alteration. It would therefore depend on the means used to develope this latent image that would determine the quality of the negative, under-exposure being an obsolete term.

At the present time we unfortunately have to deal with many under-exposed films, according to our knowledge of development, and although the image may

probably be there, we have no means of making it available. A developer sufficiently potent has yet to be discovered, and till that time comes we can do little more than make the best use of those we have. Therefore, in talking of sufficient exposure, it must be understood to mean an exposure that can be developed into a good *printing* image, in contradistinction to an image that may look pretty as a negative and interesting as a chemical effect, and that by means of developers in ordinary use, such as alkaline pyro or ferrous oxalate. I believe most photographers look to ammonia as the most effective alkali for this purpose, although by some workers perfect results have been obtained with ferrous oxalate, and with the most brief exposures.

Hydrokinone, and other unusual developing agents, may for our purposes be disregarded for the simple reason ferrous oxalate and alkaline pyro are almost universally used. Much also depends on the emulsionised plates, and in the present state of affairs these are very variable, a somewhat loose style of estimating their rapidity being adopted, the assumed standard of so many times quicker than wet collodion being a popular style of description; a wet collodion film itself varies very much in rapidity, according to the manner of its preparation. Thirty, forty, fifty, or sixty times more rapid than wet collodion conveys but a very ambiguous idea of the rapidity of the plates so labeled. The Warnerke sensitometer is, perhaps, the best available guide, and is, under certain conditions, a very useful and reliable instrument. The plates in many instances do not carry out the legends of rapidity inscribed on their wrapper, whatever means may have been used to estimate them.

There are in existence many examples of what is termed instantantaneous photography on wet collodion plates—street scenes with moving figures *sharply* depicted. It must be born in mind street scenes, in large towns and cities, are much more weakly lighted than seaside views, and to render such sharply indicates a very sensitive film. To judge by the recent attempts of street work with presumably the quickest plates in the market, the assumed fifty or sixty times rapidity is very questionable indeed. With a wet collodion plate years ago, the exposure of a portrait in a good light at the seaside average about half a second, stops *f*4 or *f*4, everything being in good order and working at its best. With an acid bath and some samples of collodion, five to ten seconds, and even longer with a similar light and stop was not too much. So it will be seen that from any point of view wet collodion can scarcely be used as a standard, *unless the time required for the exposure of the collodion and the aperture of lens used is stated.* We will put it in this way—an interior would be *properly* exposed in half an hour with wet collodion; now if there is the slightest reliance to be placed on the statement that the dry plate is sixty times faster, *half a minute* ought to be sufficient to produce a similar *well exposed negative.* For my own part I have never met with a plate that would produce as good a negative as that given by the wet collodion in half an hour in less than fifteen or twenty minutes. And I look on these statements of rapidity as most misleading, not to say ridiculous. Some effect would no doubt be produced by the short exposure, and the high lights might be indicated, but something more than this is required for a good photograph. It seems as if *only* in a brilliant light a gelatine plate works very much more rapidly than a collodion one, but where there are great contrasts, as in interiors, the difference is not nearly so great; in all probability an exposure that would have no effect on a

wet collodion plate would show the windows of an interior distinctly, but the dark portions would not be rendered any better than on the wet plate, or, in other words, they would not be impressed at all.

There is yet much to be learnt as to the behavior of gelatine plates, and the infinite variety of "makes" tends to complicate matters. The same emulsion formula will give vastly different results dependent on the manner of mixing, both in quality and rapidity, and the test standard for it varies greatly, as I have already pointed out. Under these conditions uniformity of result cannot be expected, nor can exposures be regulated with anything like certainty.

No means should be neglected to obtain uniformity, both in making the emulsion and developing. The first is, perhaps, out of the power of most photographers, who are dependent on commercial samples of dry plates; but the latter is more under their control, and a good style of development well stuck to will be much more likely to produce good results than the trial sometimes of one kind and sometimes of another. The characteristics of dry plates necessarily vary, and perhaps contrast with wet collodion and gelatine in the effect of prolonging exposure as much as anything.

The reversal of the image produced by excessive action of light is very curious. With wet plates it would simply produce dense fog, but with gelatine a point is reached where, instead of fog and density, the image gradually changes its character from a negative to a positive. Some plates are very much more prone to this than others, and where the balance is very delicate the plates are usually very difficult to manage, being apt to give an image deficient in pluck, or, in other words, work thin. Another peculiarity in some gelatine films is that—we will suppose a proper exposure effected, by continuing the exposure instead of the image reversing as in the previous case—it will continue to gain in intensity without getting any more detail, the shadows remaining as clear as if only the correct exposure had been given. Plates that give extra density in this manner are difficult to reduce by the ordinary means, hydrochloric acid and alum having very little effect. There also seems to be a tendency to want of gradation in all views that are very brightly lighted, say by full sunshine, whether interior or open landscape. This hardness is very much more pronounced in character than a similar effect produced on wet collodion, owing, I think, to the superior printing qualities of the shadows on wet collodion negatives to those of gelatine. Perhaps the difference in the physical qualities of the film may account for it, one being hard and thin and the other soft and thick. But whatever the cause, the effect is very decided, the advantage certainly lying with the wet plate, which will produce a softer and more delicate silver print.

It is a difficult matter to accurately gauge the printing qualities of a gelatine negative, but *generally* one that is *not quite clear* in the shadows gives the best results in most cases, although it looks worse as a negative than a clear, bright one. A wet collodion negative was usually condemned if there was *not* some little deposit or veiling over the whole subject. The veil in collodion was much more easily penetrated by the light than *apparently* the same amount of veil in a gelatine film, which in the case of gelatine will produce *flatness* in lieu of softness—a fault that has probably influenced photographers to so strongly advocate clear shadows in gelatine work, thus encouraging the fault of want of atmosphere that a slight trace of veil certainly gives, *providing its has the proper character.* It is

necessary to make this reservation, as the veils differ as much in character as the plates and development; but given the right sort of veil there is no doubt of its usefulness. Very skilful photographers of artistic ability like plates that give a little green fog on account of this softening effect, but if the gelatine films were ideally perfect, the films themselves being absolutely clear except where acted upon by light and of the utmost sensitiveness, the image would be probably graduated, and the effect similar to a first-rate wet plate. This is the standard we must work up to in both emulsions and development. It is an accepted fact that an under exposed negative will not produce as good a print as a correctly exposed one. There is invariably a want of printing power in the detail of the shadows.

A fault very conspicuous in much dry-plate work is that of want of atmosphere. Aerial perspective was easily obtained by wet collodion, and conferred upon negatives one of their greatest charms, for in a good wet collodion negative there was no part that ought to have it without *printable* detail; clear glass, or its equivalent, was only to be found in minute quantities in the very deepest shades. Light passing through such a negative met with a certain amount of resistance in all parts, and when we notice how much effect is produced on sensitised albumen paper by anything, even by clear glass interposing between the paper and the light, it can be easily conceived why the old wet plate gave such a soft, rich image, and that dry plates frequently fail to do so. The characteristic failing of dry plates is either to be flat in the shadows, or clear and destitute of printing detail—merely another sort of flatness. Exaggerated density in the most brightly lighted portions of a picture of either interior or landscape is often experienced when the rest of the subject has had apparently the right exposure. This is a very annoying defect, and most difficult to deal with. It is to be hoped after a time the relation of exposure to development will be better understood, and we shall gradually eliminate the faults that crop up unexpectedly and give a vast amount of trouble.

These are but stray thoughts on the matter, as I feel myself far from thoroughly acquainted with the mysteries of dry plates, and a proper exposure and development is with me, perhaps, as much a matter of guesswork as absolute and certain knowledge of cause and effect, and it seems probable that until experience sets matters right it will remain so. With regard to exposure tables—given an even, good light of the same intensity for all subjects, such tables would be exceedingly useful; but as we have to deal with light constantly varying, even when it appears uniform, their usefulness can be but limited, and the proper time of exposure, even without any other complication in the form of plates and developers, must ever be a matter of experience, until that happy time arrives when photography will equal arithmetic in results worked according to rule.

EDWARD DUNMORE,
British Journal of Photography.

A Search for a Substitute for Hypo.

BY ARTHUR H. ELLIOTT, PH. D., F. C. S.

One of the most useful discoveries ever made in the art of photography was the fact ascertained by Sir John Herschel in the year 1819, that solution of sodium hyposulphite dissolves the chloride, bromide, and iodide of silver. When we take into consideration that this salt, although now made in hundreds of tons every year, was then only a laboratory chemical and very little used, we are surprised that Herschel should have thought of using it. But he did use it,

and photographers ever since have blessed him; that is, they have done so if they got clean prints. But in spite of the wonderful solubility of the silver haloids in sodium hyposulphite, there are numerous drawbacks to its use, and various other compounds have from time to time been suggested as substitutes for this universal fixer of plates and prints.

Sir John Herschel used other solvents for the silver salts, notably ammonia and solution of common table salt.

Fox-Talbot also used a strong solution of common salt. But these solvents never entirely dissolved the silver haloids from paper, and the white parts of the picture gradually acquired a blue color, which, Talbot said, was not unpleasant, probably because he could not do any better. Robert Hunt kept some of these salt-fixed pictures for eight years, and found that they changed very little, except the blue tint acquired by the white portions.

In regard to the use of ammonia, it was found to be a good solvent for the silver haloids, but it also attacked the picture, and there was danger of destroying it completely.

Among other solvents used by the early workers in photography is potassium bromide, which was employed by Fox-Talbot and strongly recommended by him. Gustave le Gray, of Paris, used this solvent in a bath containing 360 grains in a pint and three-quarters, the fixing taking at least three-quarters of an hour; and he says it is better to wait two or three hours. Le Gray also mentions the addition of ammonia to the fixing bath of sodium hyposulphite, and recommends one fluid ounce to every quart of bath, which has a strength of about one in ten. He says this addition gives very pure whites; but the pictures were not permanent.

During the last year or two the question of using some other solvent for the silver haloids used in photography has again come up, and two substances have been tried; sodium sulphite by Captain Abney and ammonia by a Scotch photographer whose name has escaped me. In the case of the sulphite of sodium it was found to be too weak a solvent to use as a substitute for hyposulphite, although Captain Abney placed on record his work with it and made a table of its solvent power, which was published in the journals.

Thinking I might find something interesting in this question of the solubility of the silver haloids in various chemical solutions, I have made a number of experiments which I desire to place on record. Although I have not been able to find a chemical compound that will supplant sodium hyposulphite in the fixing bath, yet I have experimented with materials that are solvents of the silver haloids, and this in no mean degree.

In the first place I made a solution of silver nitrate of such a strength that one cubic centimeter of it would give 0.01830 gram of silver bromide, 0.02290 gram of silver iodide, or 0.01396 gram of silver chloride, according as the precipitant was bromide, iodide, or chloride of an alkaline metal (potassium or sodium). To put this in other words, every hundred parts of the solution would give 1.830 parts of of silver bromide, 2.290 parts of silver iodide, or 1.396 parts of silver chloride. The first series of experiments was with silver bromide.

Taking the solution of silver nitrate mentioned above, 25 cubic centimeters were used for each experiment, and carefully precipitated with potassium bromide so as to insure the least possible excess of the alkaline haloid. By this method there was secured a precipitate of silver bromide weighing 0.457 gram (7.052 grains), which was carefully washed by decantation and drained from as much water as possible.

The first step was to find out how much of a given solution of sodium hyposulphite was necessary to dissolve this moist silver bromide under constant agitation. As the result of several experiments it was found to require 8 cubic centimeters (about 2½ fluid drams) of a solution of sodium hyposulphite containing 1 part of the salt in 6 of water, which is considered a fair strength for a fixing bath. This solubility of silver bromide means that in a bath of hypo 1 in 6, every part of the silver bromide requires 2.9 parts of sodium hyposulphite for its solution.

Taking the same quantity of silver solution and producing the silver bromide in the same manner as mentioned before, the solvent action of ammonia was examined. The ammonia solution had a specific gravity of 0.96 and contained about 7 per cent. of ammonia gas. This solution was used upon the silver bromide without any perceptible solvent action, even when used to the extent of three times the volume of the hyposulphite before mentioned. It appeared that this strength of ammonia was the greatest that could be conveniently used in practice, and therefore no further experiments were made with solutions of greater strength.

The next step was to see the effect of an addition of sodium hyposulphite to the above ammonia mixture containing the silver bromide still undissolved. On adding 4 cubic centimeters (about 1¼ fluid drams) of a solution of hyposulphite (1 in 3), complete solution took place. Hence, in presence of a 7 per cent. ammonia solution, 1 part silver bromide requires about 2.9 parts of sodium hyposulphite for its solution, an amount exactly the same as in the case of the sodium hyposulphite solution of a strength of 1 in 6 mentioned above. But it must be remembered that the amount of hyposulphite in the bath was only 1 in 21 of water. Therefore the presence of ammonia facilitates the solvent action of the hyposulphite.

A solution was now made by taking equal volumes of a hyposulphite solution (1 in 3) and solution of ammonia of 0.96 specific gravity. This gives a fluid containing one-sixth of hyposulphite and 4.87 per cent. of ammonia. Using the same quantity of silver solution, the silver bromide being prepared as before stated, it required 4.5 cubic centimeters (about 1¼ fluid drams) of the mixture of hyposulphite and ammonia to dissolve 0.457 gram (7.052 grains) of the silver haloid. This means that in presence of 4.87 per cent. of ammonia, one part of silver bromide requires 1.6 parts of sodium hyposulphite for solution. So that in the presence of ammonia hyposulphite solution of the same strength will dissolve nearly twice as much silver bromide as in the case of one where the ammonia is absent.

Another mixture of ammonia and hyposulphite was now made to see the effect of diluting the bath with ammonia solution. One volume of a solution of hyposulphite (1 in 3) was diluted with three volumes of ammonia solution of 0.96 specific gravity. This gave a mixture containing one-twelfth of hyposulphite and 7.23 per cent of ammonia. Of this solution the silver bromide, as used in the previous experiments, required 7.5 cubic centimeters (about 2$\frac{1}{10}$ fluid drams) for complete solution. Hence one part of silver bromide requires 1.37 parts of hyposulphite for solution in presence of 7.32 per cent. of ammonia. But such a solution of ammonia is too strong to work with practically, and nothing further was done with it, except to keep a record of the experiment.

(*To be continued*).

ACCORDING to Joshua Smith, a firm in Paris gets 100 Francs ($20.00) a dozen for cabinet photographs. 2

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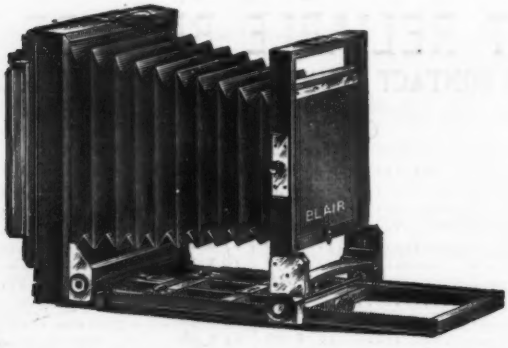

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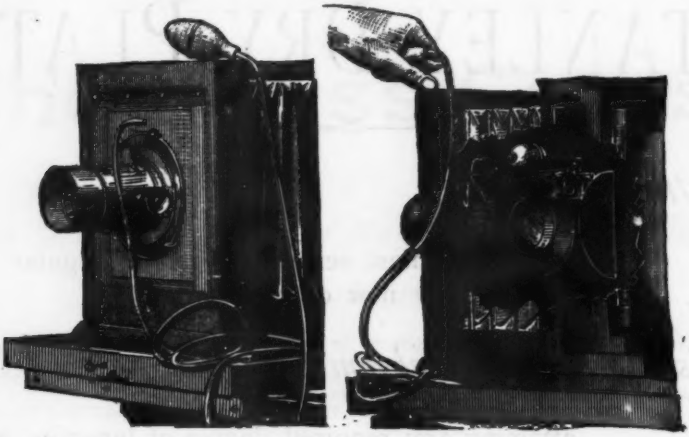

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